



SUMMER

ARMY SAFE
IS ARMY STRONG

The Rising Temperatures

☀ **As temperatures rise, so does the stress on your body.**

☀ **Two critical actions can help you battle the heat.**

- Acclimation to the heat.**
- Consumption of water.**

☀ **These two actions can help the most.**

HOW THE BODY RELEASES HEAT

- ☀ **Radiation:** transfer of heat from a hotter object to a cooler object through space by radiant energy
- ☀ **Conduction:** transfer of heat from molecule to molecule of adjacent objects
- ☀ **Convection:** transfer of heat in liquids or gases in which molecules are free to move
- ☀ **Evaporation:** heat loss involves the changing of a substance from its liquid state to its gaseous state. Evaporation is the most effective means of body heat loss.

Interfering with the Regulator

Many factors can cause imbalances in your body's ability to handle heat.

- Age**
- Weight**
- Fitness**
- Medical condition**
- Diet**

Summer Heat

- Heat stress is a serious hazard in the workplace as well as at home.
- Excessive heat can place an abnormal stress on your body.
- When your body temperature rises even a few degrees above normal (which is about 98.6 degrees Fahrenheit) you can expect
 - muscle cramps
 - become weak
 - disoriented
 - dangerously ill



Six Factors of Heat Stress

- **Temperature**
- **Humidity**
- **Movement of Air or lack of air movement**
- **The radiant temperature of the surroundings**
- **Clothing**
- **Physical activity**



The background of the slide is a faded American flag, showing the stars and stripes. The word "PREVENTION" is written in large, bold, blue capital letters with a black outline, enclosed in a thin red rectangular border.

PREVENTION

- **Individual Risk Factors:**
 - **Previous heat injury**
 - **Diet & Hydration (alcohol & supplements)**
 - **Not acclimated**
 - **Not fit - Large body mass**
 - **Minor illnesses (colds, skin problems, etc.)**
 - **Medications (prescription & OTC)**

Heat Stress-Early Sign of Trouble

- **Heat Stress will reduce your work capacity and efficiency.**
- **Signs of heat stress include:**
 - **Tiredness**
 - **Irritability**
 - **Inattention**
 - **Muscular cramps.**



Heat Stress-Early Sign of Trouble (Cont.)

- **If you are:**
 - **Overweight**
 - **Physically unfit**
 - **Suffer from heart conditions**
 - **Drink too much alcohol or smoke**
 - **Are not use to summer temperatures or acclimated to this environment**

You may be at greater risk of heat stress and should seek and follow medical advice.

Heat Rash- Another Early Sign of Trouble

- **Also known as prickly heat, occurs when people are constantly exposed to hot and humid air, causing a rash that can substantially reduce the ability to sweat.**
- **Heat rash is not just a nuisance because of discomfort, but by reducing the ability to sweat, the ability to tolerate heat is reduced.**

Heat Rash and Heat Stress

- **First Aid for Heat Rash**
 - **Cleanse the affected area thoroughly and dry completely.**
 - **Calamine or other soothing lotion may help relieve the discomfort.**
- **First Aid for Heat Stress**
 - **Good nutrition**
 - **Become Heat acclimated**
 - **Drink lots of appropriate fluids**

The background of the slide is a faded American flag, showing the stars and stripes. The title is enclosed in a red rectangular border.

Heat Cramps- Final Warning

- **May occur after prolonged exposure to heat.**
- **They are the painful intermittent spasms of the abdomen and other voluntary muscles.**
- **Heat Cramps usually occur after heavy sweating and may begin towards the end of the workday.**

Heat Cramps- First Aid

- First aid for heat cramps will vary. The best care is:
 - Rest
 - Move to a cool environment
 - Drink plenty of water- **No pop, sparkling water, or Alcohol.**
 - Electrolyte fluids.



RECOGNITION

- **Heat exhaustion**
 - **Most common form**
 - **Excessive cardiovascular demand & water- electrolyte depletion**
 - **No organ damage**
 - **Treat immediately to prevent progression to heat stroke**
 - **Treat as heat stroke if altered mental status, or mild symptoms do not improve**

RISK FACTORS



Drugs that inhibit sweating are atropine, antihistamines, some tranquilizers, cold medicine and some antidiarrheal medicines

Drinking alcohol in the hot summer weather can leave you dehydrated, confused and more susceptible to accidents and injuries.



Heat Exhaustion- Time Running Out

- May result from physical exertion in hot environments.
- Symptoms may include:
 - Profuse sweating
 - Weakness
 - Paleness of the skin
 - Rapid pulse
 - Dizziness
 - Nausea
 - Headache
 - Vomiting
 - Unconsciousness.
- The skin is cool and clammy with sweat. Body temperature may be normal or subnormal.

Heat Exhaustion- What Happened

- **Heat exhaustion develops when a person fails to replace fluids and salt that are lost through sweating.**
- **You may start to experience extreme weakness, fatigue, giddiness, nausea or a headache as heat exhaustion sets in.**



The background of the slide is a stylized American flag, with the stars and stripes visible. The title is enclosed in a white box with a thin red border.

Heat Exhaustion- First Aid

- **Rest in the shade or cool place.**
- **Drink plenty of water (preferred) or electrolyte fluids.**
- **Loosen clothing to allow for your body to cool.**
- **Use cool wet rags to aid cooling.**

TREATMENT

- **Heat Exhaustion:**
 - Rest
 - Cooling - reduce to 101°F
 - Rehydration
 - Evacuate if symptoms don't improve, or change in mental status
 - Call 911



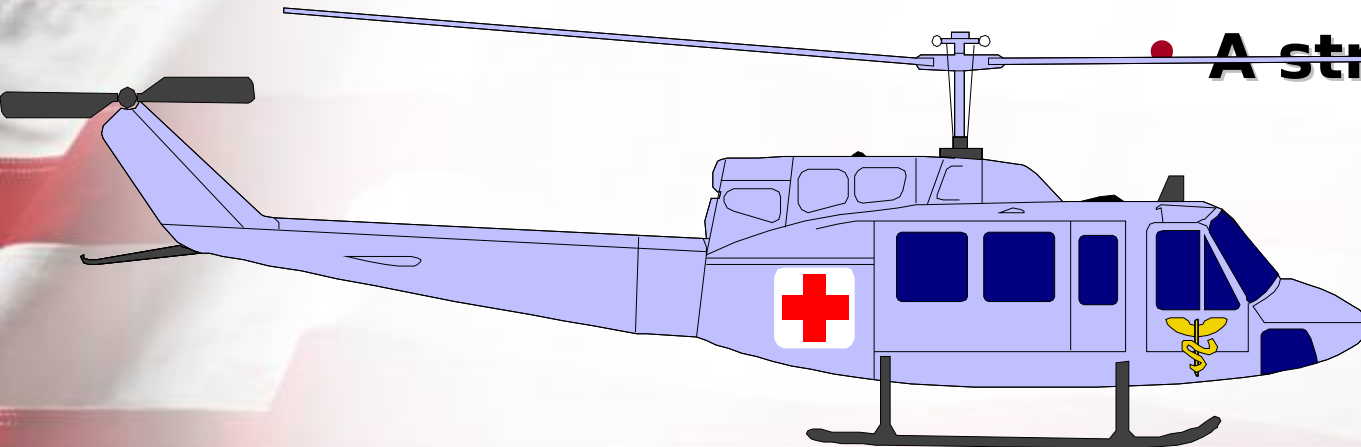
The background of the slide is a close-up, slightly blurred image of the American flag, showing the stars and stripes. The stars are white on a blue field, and the stripes are red and white.

Heat Stroke- Your Out of Time

- **This is a serious medical condition that urgently requires medical attention.**
- **Sweating is diminished or absent, which makes the skin hot and dry.**
- **Body temperature is very high (106 degrees F. and **rising**).**

Heat Stroke- Signs and Symptoms

- Mental confusion
- Delirium
- Chills
- Dizziness
- Loss of consciousness
- Convulsions or coma
- A body temperature of 105 degrees F or higher
- Hot, dry skin that may be red, mottled or bluish
- A strong fast pulse.



Heat Stroke- First Aid

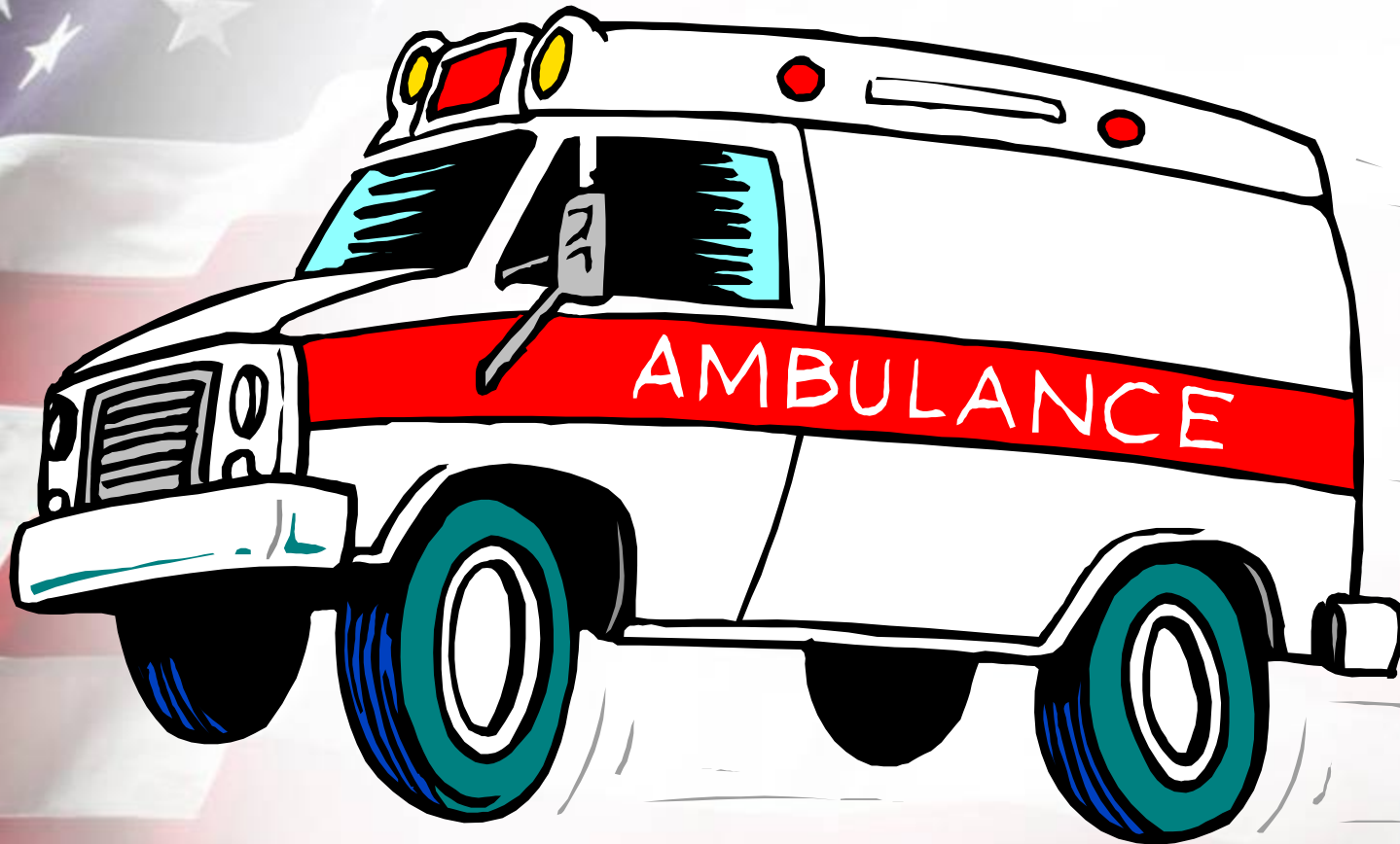
- **This is a Medical Emergency!!**
- **Brain damage and death are possible.**
- **Until medical help arrives, move the victim from the heat and into a cool place.**

Heat Stroke- First Aid

- **You must use extreme caution when soaking clothing or applying water to a victim. Shock may occur if done too quickly or with too cool of water**
- **Soak his or her clothes with water and use a fan or ice packs.**
- **Douse the body continuously with a cool liquid and summon medical aid immediately.**

For all heat injuries call:

9-1-1



PREVENTION

- ☀ **Enforce water intake and work/rest cycles**
- ☀ **Work in cooler hours**
- ☀ **Drink enough to stay hydrated**
- ☀ **Eat 3 squares/day, no supplements**
- ☀ **Learn early signs & symptoms of heat injury**
- ☀ **Ensure you wear head cover, sunglasses, sunscreen, lip balm, & skin care products when in direct sunlight**
- ☀ **Avoid working in direct sunlight**
- ☀ **Establish a good work/rest schedule; must be tailored to fit climate, physical condition of personnel**
- ☀ **Slowly increase exposure to those becoming acclimatized**

DEHYDRATION

When significant amounts of fluid are lost through high-intensity exercise, replacement with water alone can lead to a chemical imbalance in the body and deficiencies in electrolytes, which are nutrients critical for organ functioning. The electrolytes in our body include sodium, potassium, chloride, calcium and phosphate, but sodium is the substance of most concern when replacing fluids lost through exercise.



What is Dehydration?

Dehydration can be defined as "the excessive loss of water from the body." Diseases of the gastrointestinal tract can lead to dehydration in various ways. Often, dehydration becomes the major problem in an otherwise self-limited illness. Fluid loss may even be severe enough to become life-threatening.



What is Dehydration?

Cont.

Our bodies require a certain amount of fluid intake on a daily basis to function; the minimum is about equal to four 8 ounce glasses (one liter or one quart). Requirements vary with activity and age, but most active persons need two to three times this basic amount. Basic fluid intake serves to replace the fluids which are required to perform our normal bodily functions. If we take in less or lose more fluid than is needed the end result is dehydration.



What causes Dehydration?

A decrease in oral liquid intake may be due to nausea or loss of appetite; this may be worsened by an inability to keep things down (vomiting). Medications also can cause an increased fluid loss. Prior bowel resection or ileostomy can make a person more susceptible to dehydration.



Symptoms of Dehydration

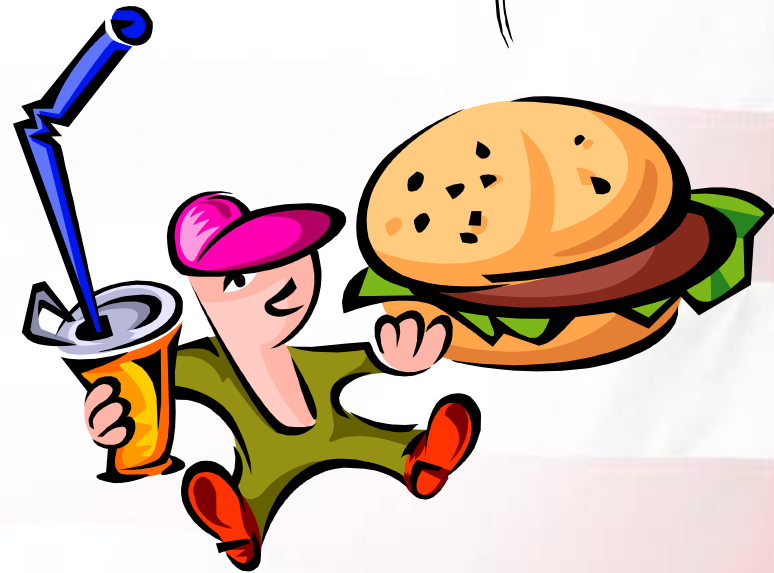
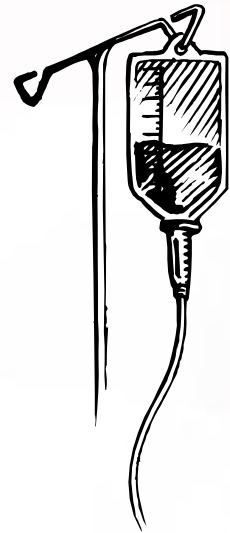
Reliable clues to indicate dehydration is rapid drop in weight, increasing thirst, dry mouth, weakness or lightheadedness (particularly if worsening on standing), darkening of the urine, or a decrease in urination. Severe dehydration can lead to changes in



Treatment/Prevention of Dehydration

► The best way to treat dehydration is to prevent it from occurring. If you suspect excessive fluid loss during and illness, your physician should be notified. Intravenous or oral fluid replacement may be needed, depending on severity of fluid loss.

► Food intake should be

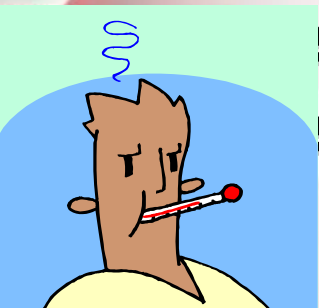


SUNBURN



SUNBURN Cont.

Sunburn is the result of not using proper skin protection while sunbathing or even from routine sun exposure. The skin becomes red, tender and swollen. You may have a stinging sensation and blistering may occur. Some people even get a low grade fever. The skin will eventually shed or peel. As the skin underneath has rawed itself.



Without Proper Skin Protection.....



it feels hotter

HEAT INDEX > Air temperature + relative humidity = apparent temperature

Relative Humidity (%)

40	45	50	55	60	65	70	75	80	85	90	95	100
136												
130	137											
124	130	137		HEAT INDEX (apparent temperature)								
119	124	131	137									
114	119	124	130	137								
109	114	118	124	129	136							
105	109	113	117	123	128	134						
101	104	108	112	116	121	126	132					
97	100	103	106	110	114	119	124	129	135			
94	96	99	101	105	108	112	116	121	126	131		
91	93	95	97	100	103	106	109	113	117	122	127	132
88	89	91	93	95	98	100	103	106	110	113	117	121
85	87	88	89	91	93	95	97	100	102	105	108	112
83	84	85	86	88	89	90	92	94	96	98	100	103
81	82	83	84	84	85	86	88	89	90	91	93	96
80	80	81	81	82	82	83	84	84	85	85	86	87

With Prolonged Exposure and/or Physical Activity
Possible heat disorders for people in higher risk groups

EXTREME DANGER > Heat stroke or sunstroke
highly likely

DANGER > Sunstroke, muscle cramps, and/or
heat exhaustion likely

EXTREME CAUTION > Sunstroke, muscle
cramps, and/or heat exhaustion possible

CAUTION > Fatigue possible

Source: National Oceanic & Atmospheric Administration

Work/Rest and Water Consumption Table

Applies to average sized, heat-acclimated soldier wearing BDU, hot weather. (See TB MED 507 for further guidance.)

Easy Work	Moderate Work	Hard Work
<ul style="list-style-type: none"> • Weapon Maintenance • Walking Hard Surface at 2.5 mph, < 30 lb Load • Marksmanship Training • Drill and Ceremony • Manual of Arms 	<ul style="list-style-type: none"> • Walking Loose Sand at 2.5 mph, No Load • Walking Hard Surface at 3.5 mph, < 40 lb Load • Calisthenics • Patrolling • Individual Movement Techniques, i.e., Low Crawl or High Crawl • Defensive Position Construction 	<ul style="list-style-type: none"> • Walking Hard Surface at 3.5 mph, ≥ 40 lb Load • Walking Loose Sand at 2.5 mph with Load • Field Assaults

Heat Category	WBGT Index, F°	Easy Work		Moderate Work		Hard Work	
		Work/Rest (min)	Water Intake (qt/hr)	Work/Rest (min)	Water Intake (qt/hr)	Work/Rest (min)	Water Intake (qt/hr)
1	78° - 81.9°	NL	½	NL	¾	40/20 min	¾
2 (GREEN)	82° - 84.9°	NL	½	50/10 min	¾	30/30 min	1
3 (YELLOW)	85° - 87.9°	NL	¾	40/20 min	¾	30/30 min	1
4 (RED)	88° - 89.9°	NL	¾	30/30 min	¾	20/40 min	1
5 (BLACK)	> 90°	50/10 min	1	20/40 min	1	10/50 min	1

- The work/rest times and fluid replacement volumes will sustain performance and hydration for at least 4 hrs of work in the specified heat category. Fluid needs can vary based on individual differences (± ¼ qt/hr) and exposure to full sun or full shade (± ¼ qt/hr).

- **NL** = no limit to work time per hr.
- **Rest** = minimal physical activity (sitting or standing) accomplished in shade if possible.

- **CAUTION: Hourly fluid intake should not exceed 1½ qts.**

Daily fluid intake should not exceed 12 qts.

- If wearing body armor, add **5°F** to WBGT index in humid climates.
- If doing Easy Work and wearing NBC (MOPP 4) clothing, add **10°F** to WBGT index.
- If doing Moderate or Hard Work and wearing NBC (MOPP 4) clothing, add **20°F** to WBGT index.

For additional copies, contact: U.S. Army Center for Health Promotion and Preventive Medicine Health Information Operations Division at (800) 222-9698 or CHPPM - Health Information Operations@apg.amedd.army.mil.

For electronic versions, see <http://chppm-www.apgea.army.mil/heat>. Local reproduction is authorized.

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